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ABSTRACT

Using a Vygotskian perspective, this study investigated the possibility of secondary school second language students providing scaffolding for each other's learning during dyadic verbal interaction on a dictogloss task. Participants in the study were 19 English-as-a-Second-Language students from China, Hong Kong, and Korea, who studied at a girl's school in Singapore. The researchers examined the students' exchanges for the presence of discourse strategies that occur in the zone of proximal development. To understand the students' socio-affective responses to collaborative work and the effect of these responses on the quality of their dyadic interaction, data were collected via student journals, questionnaires, and interviews. Findings suggest that the second language students were capable of providing assisted performance, though in many ways that are different from that given by experts to novices in the traditional notion of scaffolding. Further, the socio-affective factors may also play a key role in the success or failure of scaffolding. The implications of this study makes the case for the validity of student-student interaction as a tool for second language learning, while suggesting the need for collaborative skills to be taught and for students to understand the value of cooperation. (Contains 15 references.) (Author/KFT)

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An Analysis of Students' Dyadic Interaction on a Dictogloss Task

Lim Wai Lee and George M Jacobs

Abstract

Using a Vygotskian perspective, the researchers investigated the possibility of secondary school second language students providing scaffolding for each other's learning during dyadic verbal interaction on a dictogloss task. Participants in the study were 19 English as a Second Language students from China, Hong Kong and Korea who were studying at a girl's secondary school in Singapore.

The researchers examined students' exchanges for the presence of discourse strategies that occur in the zone of proximal development. To understand the students' socio-affective responses to collaborative work and the effect of these responses on the quality of their dyadic interaction, data were collected via student journals, questionnaires and interviews. Findings suggest that second language students are capable of providing assisted performance, though in ways that are different from that given by experts to novices in the traditional notion of scaffolding. Further, socio-affective factors may also play a key role in the success or failure of scaffolding. The implications of the study make a case for the validity of student-student interaction as a tool for second language learning, while suggesting the need for collaborative skills to be taught and for students to understand the value of cooperation.

Key Words: collaborative learning, zone of proximal development, peer scaffolding, dictogloss task, classroom-based research, Vygotsky, second language learning

INTRODUCTION

In the past two decades or so, group work has become very much in evidence in the many second language classrooms. Empirical support for the use of groups comes from research in second language (L2) education and from general education (Akcan, et al., 2001). Theory-based support for the use of groups comes from second language theorists working from interactionist perspectives, e.g., Pica et al., (1996) propose that interacting with others, including peers, enables students to gain more comprehensible input which, in turn, promotes L2 acquisition.

Another theoretical perspective that emphasises the value of interacting with others is socio-cultural theory, which asserts that all individual mental functions have their origins outside of the individual, in social interactions, not in the biological structures or isolated individual learning (Vygotsky, 1987). Vygotsky's famous notion of the zone of proximal development (ZPD) denotes a process of internalisation that takes place as external, higher mental functions begin to operate on an intramental plane. The guidance and collaboration that occur inside the ZPD were operationalised by Wood, Bruner and Ross (1976) as scaffolding. Wood et al. (1976) and Tharp and Gallimore (1988) emphasise the role of the tutor as a provider of scaffolding for the novice. However, Cazden (1988) and Donato (1994) have shown that it is possible for peers to be engaged in the ZPD. Fundamental to the success of such collaborative work is the role of affect. Indeed, Swain and Miccoli (1994) caution that group activities are often used in second language classrooms despite knowing little about how students react to such situations.

Dictogloss and Related Studies

Dictogloss (Wajnryb, 1990), the type of group activity used in the current research, consists of a dictation exercise during which the students take down notes in the form of content words in order to reconstruct the text with their peers before participating in a class discussion for the purpose of error analysis. During this task they are compelled to engage in metatalk (Swain, 1998).

Research Questions

The following two questions are addressed in this research:

1. Are L2 students able to provide scaffolding for each other's learning during verbal interaction on a dictogloss task? If so, what kind of scaffolding functions are they capable of?
2. How do students react to working collaboratively on a dictogloss task, and do these responses change over time?

METHODOLOGY

Participants

Participants in the study were 19 secondary three students at a girls' secondary school in Singapore, eighteen from the People's Republic of China (PRC), including two from Hong Kong, and one from Korea. Their first languages were Mandarin, Cantonese and Korean. English is the medium of instruction in Singapore schools. The students, who were between 14 and 17 years old, had been in Singapore for about six months. These students were considered high achievers in their home countries and were studying in Singapore on scholarship. In their home countries, they had studied English as a foreign language for about 4 years and at the time of their arrival had been diagnosed to possess competence at primary five (Singapore) level in a written test. Their oral competence was observed to be somewhat lower. All participants were informed of the rationale of the study. Six participants, five from mainland PRC and one from Hong Kong, were randomly selected for audio recording as they worked in pairs on dictogloss tasks.

Participants did not attend mainstream English classes even though they joined their secondary three peers (aged 15±) for all other subjects. Like their mainstream peers, these foreign students had 3.25 hours of English lessons in an eight-day cycle. To increase the foreign students' use of and exposure to their L2, they also had an extra two-hour lesson outside normal curriculum hours twice a week. The dictogloss sessions were conducted

during these periods for the whole class by the first author who was familiar to them as one of the teachers involved in their English education, even though she had not formally taught them until the study began.

The Data

Data sources were: (1) audio recordings of discussions during four sessions in which the dictogloss procedure was used, (2) journal entries written by all 19 students after each session with the researcher (in their journals, participants described the way they worked together as well as their thoughts and feelings about the way they had worked), (3) two questionnaires administered to the whole class and (4) one-on-one audio-taped interviews with the six audio-taped students.

The questionnaires were designed to investigate students' experience with and responses to collaborative work and dictogloss. Questionnaire 1 focused on the initial dictogloss sessions, while Questionnare 2 focused on the later dictogloss sessions. The questionnaires were not anonymous so that a triangulated profile of the recorded dyad's socio-emotive experiences could be developed. Participants were encouraged to respond to the open-ended questions in their L1 if they wished.

The one-on-one, semi-structured interviews with the six selected participants were conducted at the end of the study by the first author (who also speaks Mandarin and Cantonese) and lasted about three-quarters of an hour each. They were designed to find out more about the socio-affective aspects of the collaborative work. The interview questions were formulated after a perusal of participants' journal entries and responses to the questionnaires to confirm their views and to find out more about some issues raised. Summaries of the interviews were written and given to participants for verification of accuracy.

Data Collection

In all, the lead researcher had 11 sessions with the participants. The first three were training sessions, followed by four sessions of audio-recording during the dictogloss task, ending with four

sessions for the administration of the second questionnaire, interviews, and students' checking of the tapescripts and interview reports. Journal entries were collected from the students after each of the first 7 sessions. A more detailed description of what occurred in the sessions is presented in Table 1.

Table 1: Schedule of Data Collection

Session	Activity with Students	Data Collected
1	• Warm-up session with students • Explanation of the rationale for study • Explanation of the dictogloss procedure • Describing rationale for journal entries • Journal writing	• Journal entries
2	• Demonstration of the benefits of collaboration • Student roleplay/modeling of cooperative work behaviour • Student practise cooperative behaviour during co-construction of text • Journal writing	• Journal entries
3	• Dictogloss practise • Journal writing	• Journal entries
4	• Dictogloss procedure – Recount (anecdote) • Journal writing	• Audio recording of students' interaction • Journal entries
5	• Dictogloss procedure – Recount (news report) • Journal writing	• Audio recording of students' interaction • Journal entries
6	• Dictogloss procedure – Report (survey) • Journal writing • Questionnaire 1	• Audio recording of students' interaction • Journal entries • Questionnaire 1
7	• Dictogloss procedure – Exposition • Journal writing	• Audio recording of students' interaction • Journal entries
8	• Questionnaire 2	• Questionnaire 2
9 – 11	• One-to-one interviews • Students check accuracy of tapescripts • Students check accuracy of interviewer reports	• Tapescripts • Interviewer reports

Data Analysis

Tapescripts

One set of four recordings from one of the three dyads was chosen for analysis. This dyad was selected because of the interesting nature of their interaction and because of problems in the audiotapes of the two other dyads. The first step in analyzing the tapescripts was to segment on-task, about-task, off-task episodes using definitions adapted from Guerrero and Villamil (1994). Only on-task episodes were coded for scaffolding functions. The coding categories, based on Wood, Bruner and Ross (1976) and Tharp and Gallimore (1988), are presented in Table 2.

Table 2: Scaffolding Functions in Peer Dyadic Interaction

Recruitment of Interest (RI): Nominating or initiating topics and identifying of points for discussion It can involve a partner expressing doubt, indicating uncertainty, identifying a problem, or making a request for help and clarification. e.g.: S1: what's the other difference you have? S2: err, and its my opinion, I think do you think *effective* is a little better than *positive effects*? Here, in response to S1's invitation, S2 nominates a topic for discussion by seeking her partner's opinion on her choice of lexis.
Modelling (M): Offering behaviour for imitation Providing partner with a remembered image that can serve as a performance standard. It may involve completion or even explication of a solution already partially executed by the "tutee". An idealized version of the correct form is provided in expectation that it will be imitated. e.g.: S2: ya. mine is, *after the man described the symptoms, he follow the doctor's gave, er, gave him pres, prescription ...* S1: prescription. pres-cription. S2: uh? S1: prescription. Noticing her partner's difficulty in pronouncing the word "prescription" S1 provides a model for her.
Feedback (F): Providing partner with information on a performance as it compares to the required standard Partner may also assist by highlighting the features of the task that are relevant to provide information about the discrepancy between what her peer has produced and what is recognized as a correct production. Discrepancies are therefore highlighted and confirmation is provided for appropriate solutions. e.g.: S1: *asked the man*, is it? [softly] *asked the …* S2: *asked if.* Student 2 provides corrective feedback to S1 who seeks her opinion on the phrase she has just

constructed.
Direction Maintenance (DM): Keeping each other in pursuit of the task and working towards its completion It involves keeping the partner in the field through such means as a deployment of questions and invitation to proceed to the next step. e.g.: S1: it takes time … don't have enough time. [sound of microphone being knocked followed by laughter] S2: is it on? S1: yes, its on [unint. comment] S2: let's start. In this exchange, the participants have yet to begin their reconstruction task and are distracted by the microphone. Student 2 steers their attention to the task by an invitation to begin work.
Group Maintenance (GM): Maintaining harmony in the group and lowering affective barriers through speech acts Attempts to control frustration level in self and peer in order to complete the task effectively. Utterances that encourage the partner (e.g., praise) and, thus, provide affective support, are included in this category. e.g.: S2: I think as a doctor /he make sure- S1: /and the other, the other… S2: can you, can you allow me to speak a complete sentence. S1: sorry, sorry. S1's apology serves to placate S2 who had been annoyed by her interruption.
Questioning (Q1): Requesting a verbal response that assists by producing a mental operation the partner cannot or would not produce alone This interaction assists further by giving the assister information about the partner's understanding. In other words, she is checking her partner's understanding. e.g.: S1: first, first, arm:::, first my first sentence, what I remember is, earm, *a man went to, a man went to the doctor to ask for some medication for her, his father which is, which is ill.* S2: er, do you think *who was ill* is better than *which was ill*? S1: *who*, because, because, this is, but actually *who*, I think *who* and *which* both can because, eaarm, *which* can use for an animal, or things or humans but *who* is only use for animals. S2's question serves to highlight to her partner that her choice of pronoun is not appropriate and triggers a correction on the part of S1 who is able to give an explanation of why "who" instead of "which" should be used.
Questioning (Q2): Asking questions for the purpose of clarification as well as requests for help Requests for help here refer to issues being discussed and not to new problems. This provides scaffolding by inviting explanations and justifications from partner. e.g.: S1: here, there is something wrong, maybe, ah… S2: what's the problem? In this exchange, S1 provides unclear feedback that the sentence construction is not correct. S2 asks for further clarification.
Cognitive Structuring (CS): Giving explanations that assist by providing explanatory and belief structures that organize and justify new learning and perceptions, thus allowing the creation of new or modified schemata Instances of justification and reasoning are also included as these serve to help students arrive at a new situation definition and thus establish a new state of intersubjectivity with partner. e.g.: S1: *after the man describing his father's symptoms the doctor gave him the pills and instructed,*

instructed, "your father have to …de, de, de (this, this and this), that means *the, the doctor said.* S2: orr, I see, I see, *instructed* meant arrm:; the doctor said. or:: I see, ya, *instructed* is better. S2 had wanted to use the word "instruction" instead of "instructed" and had not quite understood the meanings of either word so S1's explanation served to help her see why the verb should be used.
Propositional Knowledge (PK): Contributing new ideas or providing a segment of text, information or detail recalled from the original dictogloss passage that assists in the successful completion of the phrase or sentence being reconstructed This pooling of information helps the dyad to make sense of the original as well as the emerging text and thus proceed with the reconstruction task. e.g.: S1: ya. then, erm, then after this, *a few days later, a few weeks later…* S2: mine is, *the man returned to the doctor.* When S1 tails off in her oral reconstruction of the sentence, S2 contributes her recollection of the next part of the sentence to enable S1 to continue.
Task Structuring (TS): Helping partner and self to participate in the task by structuring it within the ZPD For example, sequencing, segregating or structuring a task into or from components to modify the task so that both may participate at their level before moving on to the next. e.g.: S1: …can we, can we like, just rebuild the whole story first and then we link them together. first of all, *the man went to the doctor and …* S1's suggestion to gather the facts of the passage before attempting to reconstruct it had arisen from her partner's earlier attempts to do both at the same time.

Inter-rater agreement

For measurement of inter-rater agreement, one of the four tapescripts was randomly chosen. The first author collaboratively coded the first 25% of the tapescript with two post-graduate students. The rest of the same tapescript was coded independently by the three raters, and their codings were compared. Of the 256 utterances coded, there were 16 instances of disagreement, giving an inter-rater reliability score of 93.8%. Where there was disagreement in the coding, discussion was held to arrive at unanimous decisions. The remaining three tapescripts were then coded by the first author.

Journal Entries, Questionnaires and Interviews

In order to provide context to aid in the interpretation of the dyad's reactions to collaborative work, journal entries and questionnaire responses of all the 19 students were analysed. Content analysis by theme (Berg, 1995) was used for the journals and open-end questionnaire items. Themes selected for analysis were based on the two research questions. The interview reports from the recorded dyad were compared with the results from the journal entries, and open-ended questions for verification

and consolidation. The interview reports from the other two dyads were not considered since their tapescripts were not analysed. The responses from the close-ended questions were tallied by simple arithmetic.

RESULTS

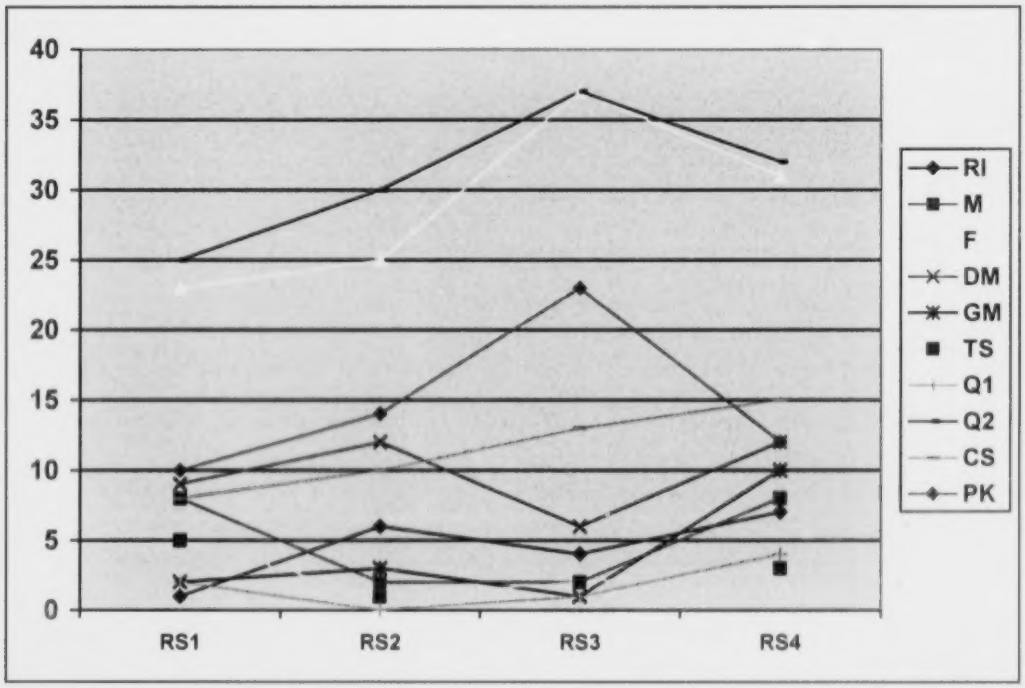
Results from Data for Research Question 1

The first research question asked: Are students able to provide scaffolding for each other's learning during verbal interaction? If so, what kind of scaffolding functions are they capable of? The analysis of the tapescripts is presented below:

Tapescripts

Figure 1 shows the number of occurrences of each of the scaffolding functions over the four recorded sessions of the one dyad.

Figure 1: Scaffolding Functions in Recorded Session (RS) 1, 2, 3, and 4.



Key to Abbreviations in Legend:

RI:	Recruitment of Interest	TS:	Task Structuring
M:	Modelling	Q1:	Pedagogical Questioning
F:	Feedback	Q2:	Questioning for Clarification
DM:	Direction Maintenance	CS:	Cognitive Structuring
GM:	Group Maintenance	PK:	Providing Propositional Knowledge

Counts for recruitment of interest increased from 1 in RS1 to 6, 4 and 7 in RS 2, RS3 and RS4 respectively. There were 8 instances of modelling in RS1 and RS4 and 2 in RS2 and RS3. Incidents of feedback rose from 23 to 25, 37 and 31 over the four recorded sessions. Direction maintenance moves from RS1 to RS4 were 9, 12, 6 and 12 respectively. Counts for group maintenance were 2, 3, 1 and 10 in RS1, 2, 3 and 4. Instances of task structuring remained low over the 4 recorded sessions at 5, 1, 2 and 3 respectively. Pedagogical questioning was also low at 2, 0, 1

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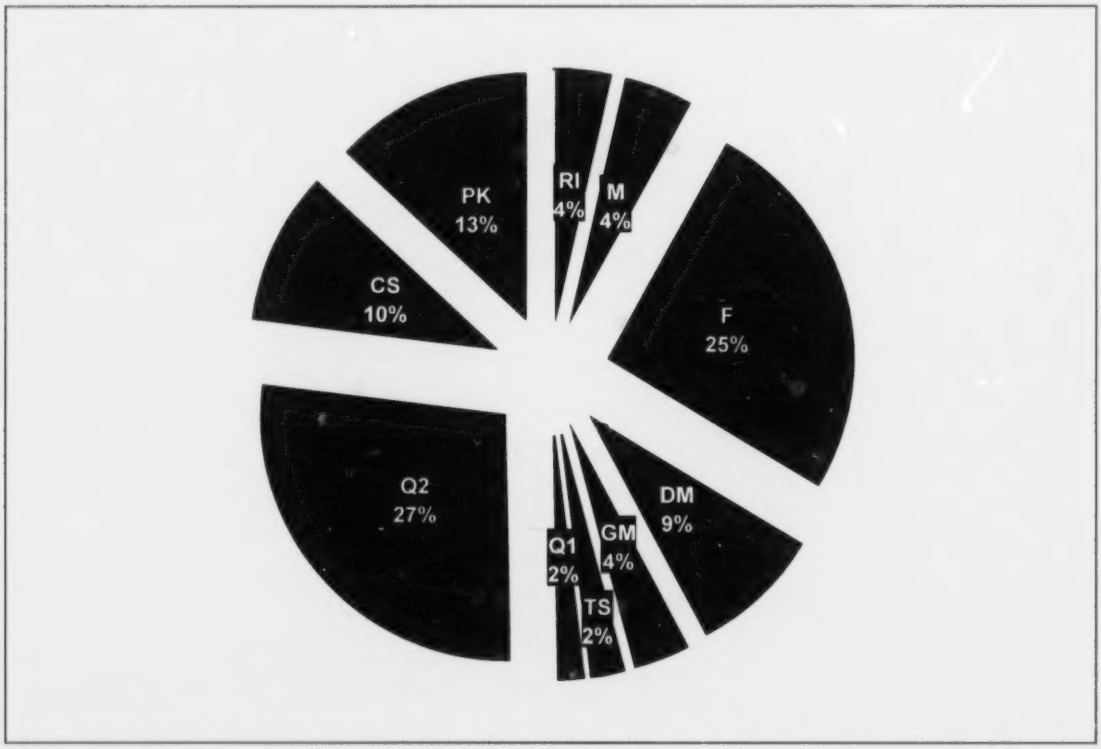
and 4 respectively. Questioning for clarification was high in all four sessions at 25, 30, 37 and 32. Cognitive structuring instances increased steadily from RS1 at 8 counts to 10, 13 and 15 at RS2, RS3 and RS4. Instances of participants providing prepositional knowledge increased over the first three recorded sessions from 10 to 14 to 23, but dropped to 12 at RS4.

Figure 2 represents in percentages how much each scaffolding function was used by the dyad over the four recorded sessions.

Figure 2: Overall Percentage of Scaffolding Functions



Immediately apparent in this pie chart is that the two most frequently used scaffolding functions were asking questions for clarification (Q2) and providing feedback (F). These two accounted for over 50% of the scaffolding functions. The other functions that the dyad used

to a significant degree were providing propositional knowledge (PK), cognitive structuring (CS) and direction maintenance (DM), the combined use of which contributed just over 30% of the use of scaffolding functions. The percentage of use of other scaffolding functions was in low single digits.

Results from Data for Research Question 2

The second research question asked: How do students react to working collaboratively and do these responses change over time? In this section data from the students' journal entries, questionnaire responses, and interviews are presented.

Journal Entries

Content analysis of the journal entries yielded three key themes related to research question 2.

a) Affective responses to and statements about partner

Early entries described tension in the students' relationship caused by their inability to communicate due to affective barriers allegedly created by the partners, such a lack of frustration control and an unfriendly, dogmatic stance. These perceptions of their partners resulted in feelings of estrangement, hurt, nervousness and despair in the respondents, e.g., "I feel a little dispirited. I do not think I could be a good teacher for her" (All quotes from participants are unedited).

The partner of the student who made this comment said that she feared making mistakes when she spoke. This caused her to be more nervous, and thus she made even more mistakes. The tension within this dyad did not appear to lessen appreciably during the duration of the study though both reported learning more about discussion through experience and practising self-regulation during instances of disagreement; "I should still be polite and pleased to my partner, if not the discussion might become a quarrel."

In her final journal entries of S1 (one of the two participants whose recorded interaction was analysed for scaffolding functions), she reflected on the immense difficulties in her earlier work experiences with S2 (her partner). She reported with self-deprecatory humour that her partner's "face

would turn red while I would get a headache for use," in addition to feeling nothing but anger while working with her. S2 did not make explicit comments on how she felt during those sessions, but she remarked in her last journal entry, "We are so immature so we are very easy to get angry. But now I know how to control the irritation."

There were six comments expressing delight in working with particular partners because of their partner's tolerance, understanding or ability to accommodate differences, which fostered a relaxed working atmosphere. Another student felt satisfaction for a different reason, "It felt better when someone could understand my English."

b) Response to Collaboration

In their first journal entries, many participants reported feeling uncomfortable because they were not accustomed to collaborative work in class. They felt awkward, not knowing what to say or how to share their opinions. In their early journal entries, more than a few participants commented on the difficulties of collaboration. Problems included not being able to get used to working collaboratively though they had no doubt of its advantages, breakdowns in communication during which partners would remain silent, feeling that the task could be done better alone and the fact that it is easier to talk about collaboration than to do it.

In subsequent journal entries, more participants expressed appreciation for learning discussion skills, as they realized that being able to work in a team was an important life skill. As one participant wrote, "No one can live very long without working with the others". Some participants reported that experience with group work made them aware of the importance of affective self-regulation during discussions. They said this could be accomplished through basic courtesy and seeking to understand ideas rather than reacting emotively to disagreements. Another bonus of collaborative work that two participants identified was getting to know their partners better and establishing relationships, "It's a good experience, we have become good friends though we can't agree."

There were also statements in recognition of the fact that collaboration and interdependence brought opportunities for learning and self-improvement. Some participants noted that they could reap the benefits of pooling resources while working on the reconstruction task. They wrote that more people working on a problem increased efficiency as discussion helped them to clarify doubts.

c) Self-appraisal of effort during the lesson

About 10 comments by participants described dissatisfaction with their own personal effort, citing carelessness, using wrong methods, errors and ignorance about pair work as the trouble sources. These comments, most of which were from the early journal entries, also expressed discomfort about doing pairwork because the respondents were not used to doing it and therefore could not do it well. Nevertheless, the large majority of comments were of a positive nature.

Questionnaires.

a) In an open-ended question that asked the participants about their feelings during the early sessions, the dominant words used were, "boring", "confused", "unhappy", "uncomfortable", and "upset", citing reasons such as: "did not like to do and was not used to discuss"; "confused because it seemed unnecessary to work in pairs, never had lessons like that before, could not get used to it", and, "we used 'its not right, you are wrong' too often, we never thought about each other's feelings". These findings match those from the journal data.

b) When asked what could have been done to mitigate their difficulties in the initial collaborative sessions, the participants made suggestions in three areas:

- Teaching them how to work collaboratively and having more practice sessions.
- Letting them choose their partners and forming groups of three rather than pairs.
- Teaching them skills related to the dictogloss task, namely, note-taking, vocabulary, listening and grammar.

c) In response to how they felt about pair work at the end of seven sessions, all the participants gave positive feedback. This concurred with findings from the journals.

d) When asked about their feelings towards how they had carried out the reconstruction task with their partners, the participants gave varied responses. Some said that they felt good about the way they had worked because they had discussions to resolve their difficulties. Others reported times that discussion did not yield any results because of lack of knowledge or unwillingness to relinquish strong viewpoints.

Interviews

The interviews focused on the themes that had emerged from the analysis of S1 and S2's journal entries:

a) Affective responses to partner at the beginning of the study

S2 felt that her partner dominated the early interactions and as a result, S2 found those sessions boring and unproductive. She said that she wrote her own text because her partner was not interested in her opinion. Feeling resentful and upset, she refused to consider S1's opinions, which caused constant and heated arguments that made them feel "like want to kill each other".

S1 admitted that she had indeed dominated the discussion at the beginning and that she "didn't give any chance to S2" because she did not trust her partner's judgement. She was also aware that she was so defensive towards S2 that she felt challenged by any difference of opinion. She remarked that she was frustrated and angry that her partner would not agree with her when she thought she knew the right answer.

b) Affective responses towards partner during later collaborative efforts

When asked what contributed to the change in the working relationship, S1 said that she did some self-examination and realised that she was prejudiced towards S2 because of hearsay. She also became aware that she had ignored some valid points made by her partner and so made a conscious effort to listen to her more carefully. S1 said that she looked at her partner's opinion as "my friend's opinion so that I would consider more carefully", as well as making a conscious effort to "be more gentle and polite". She then made the observation that her partner also changed her attitude: "I think she was glad and happy that I gave her the chance to speak more".

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c) Attitudes towards pair work and collaboration.

S1 was adamant that in the face of initial difficulties, rather than change partners, one should work hard to improve the working relationship. The reason she gave was that "you wouldn't find the problems in yourself and you wouldn't realize you have to change yourself".

Conclusion

The dyad whose interaction transcript was analyzed in the present study appears to have been able to provide some scaffolding each other. Even more encouraging is the fact that the percentage of this scaffolding increased dramatically in the second session and, though it dipped a little in the third and fourth recorded sessions, it remained improved from the first recorded session. It would be naïve to expect students to be able to provide crafted expert scaffolding when it has been shown that even teachers with the best of intentions to engage children in their ZPD do not always have the natural capability to provide assisted performance. This is a point well demonstrated in the case study of Grace (Tharp and Gallimore, 1988), a trained teacher who spent a period of five months focused on practising scaffolding skills in consultation with a trainer before she was able to use them effectively in her reading class with primary school children.

The findings of the present study suggest that scaffolding functions do not appear spontaneously in participants just because they are put in a situation that requires them to co-construct knowledge. The constructive nature of cognitive functions requires formal instruction in how to collaborate (Kozulin & Presseisen, 1995) and a process of "iterated imbrication" as suggested by Bruffee (1999, p. 45).

Having come from a traditional teacher-fronted background, the participants in the study doubted the ability of their peers to assist their performance and learning. Bruffee (1999) acknowledges that such participants have to learn, sometimes against considerable resistance, to grant authority to a peer instead of a teacher and to exercise that authority judiciously and helpfully in the interest of a peer. As social interaction takes place at a particular point in time and in a particular context, the students, as was the case with those in this study, bring with them their past knowledge,

and cultural practices which will either facilitate their participation in this new collaborative event or lessen the worthiness of the new activity in their eyes.

In conclusion, the results of the present study provide evidence that peer collaboration among second language learners can succeed in terms of both cognition and affect. In other words, two (or more) heads can be better than one. However, just putting students into groups and setting them a task may often not produce the hoped for levels of success (Johnson & Johnson, 1994). Second language educators need to carefully consider what type of preparation students may need in order that their two heads reap the benefits of collaboration.

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